DEPARTMENT OF CELL BIOLOGY

CELL BIOLOGY SPECIALIZATION

UNDERGRADUATE PROGRAM REQUIREMENTS

Continuation or graduation in the Honors Cell Biology program requires a minimum GPA of 2.3 on at least *24 in each preceding Fall/Winter period credited to the degree. Graduation requires a minimum 2.3 GPA over all courses credited to the degree.

	Year 1		Year 2
BIOL 107	Introduction to Cell Biology	BIOCH 200	Introductory Biochemistry
CHEM 101	Introductory Chemistry I	BIOL 207	Molecular Genetics and Heredity
CHEM 102	Introductory Chemistry II	CELL 201	Introduction to Molecular Cell Biology **OR**
CHEM 261	Organic Chemistry I **OR** CHEM 164		BIOL 201 - Eukaryotic Cellular Biology
MATH 114	Elementary Calculus	CHEM 263	Organic Chemistry II
PHYS 124	PHYS 124 – Particles and Waves	GENET 270	Foundations of Molecular Genetics
PHYS 126	PHYS 126 – Fluids, Fields, and Radiation	MICRB 265	General Microbiology
*6 junior	ENGL **OR**	STAT 141	Introduction to Statistics **OR**
	*3 junior ENGL **AND** *3 junior WRS		STAT 151 - Introduction to Applied Statistics I
*3	in Cell Biology Approved Options (see note 1 and 2)	*6 from	Cell Biology Approved Options (see note 1 and 2)
		*3	in Arts Options
	Year 3		**Year 4**
CELL 300	Advanced Cell Biology I	*3 from	a 400–Level CELL course
CELL 301	Advanced Cell Biology II	*9 from	Cell Biology Group A Options
*3 from	BIOCH 310, 320 **OR** 330	*15 from	Cell Biology Approved Options (see note 1 and 2)
*6 from	Cell Biology Group A Options	*3	in Arts Options
*9 from	Cell Biology Approved Options (see note 1 and 2)		
*6	in Arts Options		
NOTE:	CHEM 371 requires MATH 115 be taken as Cell Biology Group A option, in Year 2		
	Cell Biology Group A Options		**Cell Biology Recommended Options**
BIOCH 401	Biochemistry Laboratory	ANAT 200	Human Morphology
BIOCH 420	Protein Chemistry	ANAT 400	Human Embryonic Development
BIOCH 425	Proteomics	ANAT 401	Human Neuroanatomy
BIOCH 430	Gene Expression OR GENET 304	ANAT 402	Human Histology
BIOCH 441	Structure and Function of Biological Membranes	BIOCH 310	Bioenergetics and Metabolism
BIOCH 450	The Molecular Biology of Mammalian Viruses	BIOCH 320	Structure and Catalysis
BIOCH 481	Design and Construction of Synthetic Biological Systems I	BIOCH 330	Nucleic Acids and Molecular Biology
BIOCH 482	Design and Construction of Synthetic Biological Systems II	BIOCH 410	Signal Transduction
BIOL 421	Molecular Evolution and Systematics	BIOCH 445	Biochemistry of Lipids and Lipoproteins
BOT 303	Plant Development **OR** ZOOL 303	BIOCH 465	Methods in Molecular Biophysics
CELL 310	Evolution and Diversity of the Cell	BIOL 108	Organisms in Their Environment
CELL 398	One Term Research for 3rd year students	BIOL 208	Principles of Ecology
CELL 402	The Birth and Death of a Cell	BIOL 315	Historical Perspective
CELL 405	Cell Biology of Disease	BIOL 321	Mechanisms of Evolution
CELL 425	Systems Biology	BIOL 322	Diversity and Evolution of Microbial Life
CELL 445	Current Topics in Cell Biology	BIOL 335	Principles of Systematics
CELL 498	One Term Research Project	BIOL 380	Genetic Analysis of Populations
CELL 499	Two Terms Research Project	BIOL 391	Techniques in Molecular Biology and Bioinformatics
CHEM 282	Atomic and Molecular Structure	BIOL 430	Experimental Biology
CHEM 371	Energetics of Chemical Reactions	BOT 382	Plant Biotechnology
CHEM 373	Physical Properties & Dynamics of Chemical Systems	GENET 301	Simple Genomes
CHEM 464	Bio-conjugate Chemistry	GENET 302	Complex Genomes
GENET 304	Gene Expression and its Regulation **OR** BIOCH 430	GENET 364	Plant Genetics
GENET 305	Genetic Analysis	GENET 390	Gene Manipulation
GENET 375	Introduction to Molecular Genetics Techniques	GENET 408	Replication
GENET 420	Research Techniques in Molecular Genetics	GENET 412	Genetic Control of Development
IMIN 200	Infection and Immunity	GENET 418	Human Genetics
IMIN 324	Basic Virology	IMIN 371	Introduction to Immunology
IMIN 372	Research Techniques in Immunology	IMIN 401	Comparative Immunology
IMIN 405	Innate Immunity	IMIN 410	Bioinformatics for Molecular Biologists
IMIN 452	Advanced Immunology	MICRB 311	Microbial Physiology
GENET 304	Gene Expression and its Regulation **OR** BIOCH 430	MICRB 315	Applied Microbiology & Biotechnology

		MICRB 343	Analysis of Microbial Macromolecules
MATH 115	Elementary Calculus II	MICRB 410	Structure of Microorganisms
MICRB 316	Molecular Microbiology	MICRB 450	Fermentation Biotechnology
MICRB 470	Advanced Microbial Genetics	MMI 351	Bacterial Pathogenesis
MMI 391	Current Methods in Molecular Biology	MMI 352	Practical Pathogenic Bacteriology
ONCOL 320	Introduction to Oncology	MMI 405	Mechanisms of Pathogenecity I
PMCOL 371	Cellular Neuroscience **OR** ZOOL 342	MMI 415	Mechanisms of Pathogenecity II
ZOOL 303	Animal Development **OR** BOT 303	MMI 426	Medical Parasitology
ZOOL 342	Neurobiology **OR** PMCOL 371	MMI 445	Clinical Microbiology and Human Health
		NEURO	- Any
		ONCOL 425	A + B – Advanced Topics in Cancer Research
		PHYSL 212	Human Physiology I
		PHYSL 214	Human Physiology II
		PHYSL 372	Systems Neuroscience
		PHYSL 401	Molecular and Cellular Physiology
		PHYSL 403	Neuroendoimmunomodulation
		PMCOL 201	Introduction to Pharmacology
		PMCOL 202	Topics in Pharmacology
		STAT 337	Biostatistics
		ZOOL 241	Animal Physiology I
		ZOOL 242	Animal Physiology II
		ZOOL 442	Current Topics in Intercellular Communication

Not approved: BIOL 341; BOT 380; MICRB 320; MMI 133; PMCOL 305; PSYCO 104

NOTES:

(1) Students are required to consult the Department of Cell Biology for selection and approval of all options.
(2) Students are encouraged to select approved options from the Cell Biology Group A or Recommended options list, but may also follow a course of study tailored to their interests (must be approved by a Cell Biology advisor).